

## 4.1 Interpreting the Meaning of the Derivative

Calculus

Name: \_\_\_\_\_

**CA #1**

**For each problem, a differentiable function is given along with a definition of the variables. Interpret the values in the context of the problem.**

<p>1. A file is downloaded to a computer at a rate modeled by <math>f(t)</math>, where <math>t</math> is the time in seconds since the start of the download and <math>f(t)</math> is measured in megabits per second. Interpret <math>f'(13) = 25</math>.</p>	<p>2. The rate of change of a short-distance track runner is modeled by <math>r(t)</math>, where <math>r</math> is measured in feet per second and <math>t</math> is seconds. Interpret <math>r'(0.5) = 2</math>.</p>
<p>3. The rate of water leaking from a tank, in gallons per hour, is modeled by <math>R(t)</math>, where <math>t</math> is measured in hours. Interpret <math>R'(1) = 23</math>.</p>	<p>4. The number of bees in a beehive at time <math>t</math> days is modeled by the function <math>b(t)</math>. Interpret <math>b'(30) = 15</math>.</p>
<p>5. The rate of consumption of gasoline of Mr. Kelly's station wagon can be modeled by <math>f(t)</math>, where <math>f</math> is measured in gallons per hour and <math>t</math> is hours. Interpret <math>f'(1) = 1.2</math>.</p>	<p>6. The number of mistakes Mr. Brust makes in his math packets is modeled by <math>m(p)</math> where <math>p</math> is the number of packets he has completed so far this year. Interpret <math>m'(10) = 13</math>.</p>
<p>7. The height of someone riding on a Ferris wheel <math>t</math> minutes after the ride begins is modeled by <math>h(t)</math> where <math>h</math> is measured in feet. Interpret <math>h'(3) = 45</math>.</p>	<p>8. The time it takes for a sample of water to evaporate can be modeled by <math>t(S)</math>, where <math>t</math> is time, in minutes, and <math>S</math> is the size of the sample, measured in milliliters. Interpret <math>t'(208) = 0.9</math>.</p>

<p>1. At 13 seconds, the rate the file is downloading is increasing by 25 megabits per second per second.</p>	<p>2. At 0.5 seconds, the rate of the runner is increasing by 2 feet per second per second.</p>	<p>3. At 1 hour, the rate of water leaking is increasing by 23 gallons per hour<sup>2</sup>.</p>
<p>4. On the 30<sup>th</sup> day, the number of bees is increasing by 15 bees per day.</p>	<p>5. After 1 hour, the rate of consumption of gas is increasing by 1.2 gallons per hour per hour.</p>	<p>6. While making the 10<sup>th</sup> packet, Mr. Brust is making 13 mistakes per packet.</p>
<p>7. On the 3<sup>rd</sup> minute, the height is changing by 45 feet per second.</p>	<p>8. On the 208<sup>th</sup> minute, the water is evaporating at a rate of 0.9 milliliters per minute.</p>	

Answers to 4.1 CA #1